

Ag engineer offers dairy building update

BY MONTIE TAK
Staff Correspondent

CHAMBERSBURG — "When we finish deciding which way the milkhouse door should swing, we get it approved," says Robert Graves.

Graves was addressing the almost 100 farmers, builders and engineers attending the Fifth Annual Farm Builders Conference and Tour in Chambersburg on Jan. 29 and 30. An extension agricultural engineer from Penn State, Graves presented a dairy building update.

"My intention is to familiarize you with the kinds of informational material available. The reason this is important to you is because the guidelines have been developed to help you."

He also discussed a survey where respondents were to pinpoint five major areas they perceived as problems on their neighbors' farms as well as on their own farms. The results:

	other's farms	my farm
nutrition	24%	14%
housing	44	41
health	15	19
reproduction	3	8
general	14	18

Under housing, general problems were cited 40 percent of the time, 20 percent of the farmers cited ventilation problems, and crowding was seen as a problem by 25 percent of the farmers.

In summation Graves told the builders, "We have a lot of building needs out there." He addressed the heart of the builder-farmer relationship by saying, "What's the first thing you want in a client? One who pays, yes. And one who recognizes he has a need that involves buildings. Forty percent of the people on that chart have that need."

"The market is out there and we have the information available for you to make it possible."

Martin E. Moore says we can govern dairy animal injuries or lack of injuries by design.

"We are not just building a building," said the agri-designer and consultant from Copake, NY. "We are housing an animal."

He says one of the most critical

injuries to a cow is an injury to the udder—"really the dollar part of the cow." Injuries to the hock, jaw, knee, brisket and hip may also occur in poorly constructed buildings.

"You have to gear the building to the cow. If you do, you make the cow comfortable and the farmer profitable." He sees two clients, the cow and the farmer, who must be considered by the builder and he cautioned his audience, "If the farmer is not successful, we're all in trouble."

Moore calls the importance of master planning on the farm "absolutely critical" and says it should take into account placement of present buildings and future needs and expansion. Feeding, manure storage and traffic planning must be considered. He says if you plan future expansion on paper, it is easy to see errors before they occur. "Get it all together before you start."

He emphasizes the importance of good air flow and ventilation. He encourages farmers to insulate under the roof to protect the building materials from condensation and to produce a quieter barn. He also prefers not having overhead hay storage because of fire hazard.

Moore urged builders to update



Robert Graves, Penn State extension agricultural engineer, gives an update on dairy buildings.

construction plans because materials or techniques that may have been sufficient last year may be outdated now because of new technology.

One of the areas Moore sees as critical is manure handling and he calls it "the topic of the eighties." While most people think they are on top of the feeding programs and designing buildings, he says comparatively few know proper

manure handling and storage. He also wants to see farmers and builders view attractive farms as good dairy advertisements. "If you're talking about marketing milk, consider the aesthetics around the farm. Present the cow so she looks her best."

He suggests using a pole building for hay storage, placed near the barn. He also likes to see silos

(Turn to Page A30)

Proper design important in swine manure storage systems

BY MONTIE TAK
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CHAMBERSBURG — Farmers could find themselves in a lot of potential hot water if their swine manure storage system is not designed correctly, says Daniel J. Meyer.

Meyer, an extension agricultural engineer from Penn State University, was speaking at the Fifth Annual Farm Builders Conference and Tour held in Chambersburg on Jan. 29 and 30. Almost 100 engineers, builders and farmers as well as 11 exhibitors attended the conference.

"A 250 sow, farrow to finish unit produces 68,500 cubic feet of manure in six months," says Meyer. This is about 514,000 gallons and is roughly equivalent to the amount of manure produced by 200 cows in 180 days, or 670 vealers during the same time period, he adds.

With that kind of manure output, correct handling and storage techniques and facilities are

paramount. Poorly designed systems can cause odors, health problems, poor relationships with neighbors and water pollution. He also emphasized many of the factors of correct swine manure handling and storage would pertain to dairy animals as well.

Meyer addressed the common manure management systems available. The options for swine management are to keep the animals in pasture or open lots, in confinement lots or confine the swine in buildings. Confinement lots can have a runoff problem and if confinement buildings are used, the farmer needs to know how to move and store the manure.

A farmer should also consider matching storage needs to building location. He must know local building code regulations and consider the proximity of homes to the storage system.

"The farmer has to live with the complaints," says Meyer, not the builder. Use common sense when you design that system."



Daniel J. Meyer, Penn State Extension Agricultural Engineer, talks about swine manure storage systems.

Another important factor in engineering the system is to consider potential pollution problems of ground and surface water.

Options available for storing liquid manure are open or covered storage, mechanically aerated storage or use of a treatment lagoon. Open storage can be either above ground, in-ground or earthen storage other than a lagoon.

Covered storage can be in-ground, below the floor of a confinement building or earthen storage with a roof system, such as fiberglass, to keep odors down.

Meyer calls lagoons "a live system" because of the presence of sensitive bacteria that keep breaking down the solids in the manure.

Farmers and builders can do several things to reduce the odor level in a storage system Meyer pointed out that you can incorporate aerators to pump in oxygen, settling tanks to remove solids, add chemicals or enzymes

or use mechanical separators.

Aerators have a high initial cost as well as a high operating cost. Since they are subject to mechanical breakdown, Meyer advocates having a spare aerator. Mechanical separators also represent a high cost and are subject to breakdown.

While digesters may cut down on the amount of odors, they are an expensive system. Chemical additives can also cost a lot and when added, can create additional odors.

"There are a lot of expensive options," Meyer advised his audience. "The farmer can have a lot of problems if that system is not right."

He urged builders and engineers to check for potential water pollution and neighbor problems as well.

"Builders must do the follow-up. Does the farmer understand the controls? If he knows how to use his system well, the success rate is better."

Animal science professor views horse barn design

BY MONTIE TAK
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CHAMBERSBURG — "A hobby that got out of hand" is how James P. Gallagher describes the horse business.

As professor of animal science at Penn State, Gallagher should know. He shared his views on horse barn design with almost 100 builders, farmers and engineers at the Fifth Annual Farm Builders Conference and Tour in Chambersburg on Jan. 29 and 30.

He says the principles of horse planning are similar to dairy planning. Factors to consider are the size of operation, zoning restrictions, water supply, topography and if the facility will be a nuisance to neighbors. If the land has existing buildings, you need to find if remodeling will be practical, economical and aesthetic; if the building layout is convenient, and what kind of electrical and water service the building has. Gallagher also asks, is the building only for horses, or is bedding, feed and tack to be kept there as well?

"Horses in nature get along

outside very well as long as they can get out of the wind," says Gallagher. But people may choose to keep show or sale stock in barns to give each one individual attention. In that case, he advises box stalls to measure 12 feet by 12 feet, with doors at least four feet wide, partitions seven feet high and nine foot ceilings in the stalls. Lights should be mounted flush with the ceiling.

He prefers sliding stall doors and says he would like to see a builder design a sliding door that would position itself either open or closed. "There is no more dangerous thing to a horse than a half-open door," adds Gallagher.

In barns with a center aisle and two rows of stalls, he advises builders to leave a small space between boards on the stall fronts to allow for air movement. They should use two-inch thick material to line the stalls because horses may kick and go through the side of a building.

He says one of the most controversial subjects is the flooring material. The tradition in America is to use clay stall floors, but Gallagher says horses can paw

holes in it and it can become soaked with urine over a period of time. Asphalt, concrete and

limestone screenings covered with rubber mats can also be used.

"The single largest problem in horse barns today is ventilation," he says and urges builders to make it one of their main concerns. He also likes to use automatic horse waterers and to have an opening in the stall wall so the horse may be fed from outside the stall.

Horses love to chew on wood and he told the builders to make sure wood construction is flush or metal covered. He has successfully used corner edging for drop ceilings to cover exposed wood edges.

Breeding operations should include a confinement chute for breeding exams or for medicating horses. Breeding areas should have good footing and lighting, be dust free and be located near the farm laboratory.

Other factors to be considered are drainage, manure storage and disposal, local zoning and fly problems. Gallagher urged the

audience, "Maintain a good image in the horse industry."

M. Lynn Sammons, D.V.M., from Willow Creek Animal Hospital in Reading, also shared his views. "Safety is still the number one thing in a horse barn," he says. "If there is something that

can go wrong, it will."

His preferences on ceiling height are either a flat ceiling seven feet high or one ten feet high. There should be no protruding nails or sharp edges anywhere in the stalls. "Sheet metal is a disaster to have in a barn," he notes. He also considers good ventilation and dust control essential.

If you include a treatment area in the barn, it should be comfortable and safe for horses and humans. It should be well-lit and constructed so you can get away from a fractious horse if necessary. "It's wonderful what a horse can do if he doesn't want to be there," adds Sammons.

He recommends the use of clay floors in the backyard barn and says concrete is good in the wash bay. No smoking should be allowed



James Gallagher

in the barn and he also advocates the use of an early detection system.

"This is an excellent opportunity for builders to make a well-thought-out, constructed product for the customer," he summed up. Sammons advised builders to do it right "or the horse will tear it back down for you."